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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,409	07/11/2002	Ching-Hsiang Hsu	EMEP0021USA	7458

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NAIPO (NORTH AMERICA INTERNATIONAL PATENT OFFICE)
P.O. BOX 506
MERRIFIELD, VA 22116

EXAMINER

BOOTH, RICHARD A

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 07/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/064,409

Applicant(s)

HSU ET AL.

Examiner

Richard A. Booth

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-6, and 9-16 is/are rejected.
- 7) ☒ Claim(s) 4, 7 and 8 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: .

DETAILED ACTION

Claim Objections

Claim 12 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 12 does not have all the limitations of the independent claim because it teaches replacing limitations of the independent claims and substituting them with other limitations.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 lacks antecedent basis for "said n-type region implanted...". Clarification is required. No prior art rejection is made on these claims because the scope of the claims cannot be determined.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2, 5-6, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onakado et al., U.S. Patent 6,107,659 in view of Bergemont, U.S. Patent 5,409,854 and further in view of komori et al., U.S. Patent 5,352,620.

Onkado et al. shows the invention substantially as claimed including a structure of an embedded channel write/erase flash memory cell comprising: an n-type silicon substrate; a flash memory cell comprising mainly: a deep p-well formed on in said substrate; an n-well formed on in said deep p-well; a stacked gate formed on said n-well; and associated peripheral transistor circuitry (see fig. 42 and col. 24-lines 33-55).

Onkado et al. fails to expressly disclose the peripheral transistors formed in a triple well and a shallow and deep p-type region formed in the n-well of the flash memory cell.

Bergemont discloses forming both the peripheral and memory circuitry of a nonvolatile memory device in triple wells (see fig. 2B and col. 4-lines 52-57). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the structure of Onkado et al. so as to have both the peripheral and memory arrays formed in triple wells because this provides increased breakdown voltage protection for both the memory and peripheral circuits.

Komori et al. discloses forming both deep and shallow regions in a memory cell region of an opposite conductivity type to the substrate in order to improve the reading and writing of the eeprom cell (see col. 2-lines 46-63 and fig. 3). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the structure of Onkado et al. modified by Bergemont so as to form a shallow and deep p-type region in the n-well of the memory cell because this would allow for the formation of a highly efficient p-type flash memory.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Onakado et al., U.S. Patent 6,107,659 in view of Bergemont, U.S. Patent 5,409,854 and further in view of Komori et al., U.S. Patent 5,352,620 as applied to claims 1-2, 5-6, and 13-16 above, and further in view of Hsieh et al., U.S. Patent 6,204,126.

Onkado et al., Bergemont, and Komori et al. are applied as above but fail to expressly disclose wherein a smiling effect pattern is caused by oxidation between said stacked gate and said oxide layer.

Hsieh et al. discloses using the smiling effect in order to improve the efficiency of a flash memory cell (see abstract). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Onakado et al. modified by Bergemont and Komori et al. so as to cause a smiling effect between the stacked gate and the oxide layer in order to improve programming efficiency.

Allowable Subject Matter

Claims 4 and 7-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,506,647 discloses forming an electrical short between doped regions using a metal layer (see fig. 17), and U.S. Patent 6,060,360 discloses a p-channel EPROM device (see abstract).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A. Booth whose telephone number is 308-3446. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 308-3325. The fax phone numbers for

Art Unit: 2812

the organization where this application or proceeding is assigned are 308-7724 for regular communications and 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-1782.



Richard A. Booth
Primary Examiner
Art Unit 2812

July 1, 2003